

Psychological Trauma: Theory, Research, Practice, and Policy

Optimism Predicts Positive Health in Repatriated Prisoners of War

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Optimism Predicts Positive Health in Repatriated Prisoners of War

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“Positive health,” defined as a state beyond the mere absence of disease, was used as a model to examine factors for enhancing health despite extreme trauma. The study examined the United States’ longest detained American prisoners of war, those held in Vietnam in the 1960s through early 1970s. Positive health was measured using a physical and a psychological composite score for each individual, based on 9 physical and 9 psychological variables. Physical and psychological health was correlated with optimism obtained postrepatriation (circa 1973). Linear regressions were employed to determine which variables contributed most to health ratings. Optimism was the strongest predictor of physical health ($\beta = -.33$, $t = -2.73$, $p = .008$), followed by fewer sleep complaints ($\beta = -.29$, $t = -2.52$, $p = .01$). This model accounted for 25% of the variance. Optimism was also the strongest predictor of psychological health ($\beta = -.41$, $t = -2.87$, $p = .006$), followed by Minnesota Multiphasic Personality Inventory–Psychopathic Deviate (MMPI-PD; McKinley & Hathaway, 1944) scores ($\beta = -.23$, $t = -1.88$, $p = .07$). This model strongly suggests that optimism is a significant predictor of positive physical and psychological health, and optimism also provides long-term protective benefits. These findings and the utility of this model suggest a promising area for future research and intervention.

Keywords: optimism, positive health, resilience, PTSD, veterans

Numerous psychological studies have assessed the impact and long-term effects of trauma on individuals, with research focusing almost exclusively on patients with posttraumatic stress disorder (PTSD; Tedeschi, Park, & Calhoun, 1998). This type of research supports medical practitioners in alleviating mental and physical suffering through proper diagnosis and subsequent removal of the disease. In other words, the health of the individual is based on the absence of illness with the majority of scientific research concentrating on the removal of illness.

Alternatively, research interest in the relationship between optimism and health has grown substantially over the past several decades. The results of these studies have shifted the scientific community’s focus to a new paradigm of overall well-being, designated as “positive health.” This new holistic model is a concept originating from the field of positive psychology and is defined as the physical, mental, and social well-being of an individual beyond the absence of disease (Seligman, 2008).

Research utilizing the positive health perspective has provided direct evidence documenting optimism’s association with in-

creased positive psychological health in those afflicted by extreme trauma or illness (Seligman, 2008; Segovia, Moore, Linnville, Hoyt, & Hain, 2012). In addition, optimism has been shown to reduce the risk of certain physical illnesses such as coronary heart disease and cardiovascular mortality in healthy populations. Studies have also indicated optimism is associated with decreased death rates in patients with renal failure and those suffering from HIV (Chida & Steptoe, 2008).

More recent research has established a relationship between optimism and reduced rates of psychiatric illness in survivors of extreme trauma. One specific study conducted by Segovia et al. (2012) examined resilience in Vietnam-era repatriated prisoners of war (RPWs) because these men spent more time in captivity than any American soldiers in history. Furthermore, these RPWs had numerous documented cases of extreme trauma, including physical and psychological torture, prolonged captivity, and malnourishment. In this study, Segovia et al. (2012) confirmed along with others (King, King, Schuster, Park, Moore, Kaloupek, & Keane, 2011; Park, Kaiser, Spiro, King, & King, 2012) that the following subset of predictor variables accounted for reduced rates of psychiatric illness: officer versus enlisted status, older age at time of capture, shorter length of solitary confinement, low antisocial/psychopathic personality traits, and low posttraumatic stress symptoms (PTSS) following repatriation. Moreover, Segovia et al. (2012) expanded this list of predictors to include optimism, which proved to be the strongest predictor of resilience. Optimism was also a more robust predictor of resilience than other variables such as amount of torture experienced or length of solitary confinement.

Despite optimism’s impressive role, the definition of “resilience” used in that study—which was the absence of psychiatric illness—is, in itself, a limited definition. The investigation was to expand this definition of resilience and relook at these same RPWs’ current health to determine if resilience included state of

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health. For example, other psychological measures often associated with positive health also include quality of life, life satisfaction, personal growth, and so forth (Seligman, 2008; Seligman, Steen, Park, & Peterson, 2005). Similarly, research on positive physical health based on common medical standards of practice has included examination of biological variables relevant to health, such as allostatic load, cumulative illness rating, telomere length, and so forth (Seligman, 2008). Thus, guided by the notion that optimism predicts the absence of psychiatric illness even in the face of extreme trauma, in the present study, we sought to understand whether optimism continued to contribute to positive health outcomes when the definition was expanded to include both physical variables and a more comprehensive definition of psychological health. Using Seligman's (2006, 2008) conceptual framework, we operationalized the notion of positive health for the current study into two domains: a physical domain to include biological and functional factors, and a psychological subjective domain.

Method

Data

The Robert E. Mitchell Center for Prisoner of War (POW) Studies hosts the only annual voluntary medical and psychological follow-up program within the U.S. Department of Defense. Since the Center's inception in 1973, Vietnam-era repatriated POWs (RPWs) have been eligible for annual medical and psychological treatment. This unique institution singularly holds the only longitudinal data set documenting the long-term medical effects to American RPWs. The present study uses this longitudinal data set (see Segovia et al., 2012, for full details) to examine a cohort of RPWs who have been followed for nearly 40 years with assessment at four time points: 1973, 1975, 2010, and between March, 2011 and February, 2012. The current study collected data from the 128 Vietnam RPW's who presented for follow-up between March, 2011 and February, 2012.

The majority of study participants were White (97%), of officer rank (93%), educated ($M = 16$ years, $SD = 2$), and approximately 72 years old ($SD = 6$). Informed consent was obtained from each repatriate, and the research protocol was approved by an institutional review board.

Measures

Independent variables: Previously examined predictors of resilience in RPWs (eight variables total). To provide a comprehensive analysis of this unique population, we incorporated previously documented predictors of psychological resilience in repatriated prisoners of war into our study (King, King, Schuster, Park, Moore, Kaloupek, & Keane, 2011; Park, Kaiser, Spiro, King, & King, 2012; Segovia et al., 2012, 2013): officer (compared with enlisted) status (Predictor 1), older age at time of capture (Predictor 2), shorter length of solitary confinement (Predictor 3), low PTSS following repatriation (Predictor 4), lower number of captivity-related medical problems (Predictor 5), and fewer sleep complaints at time of repatriation (Predictor 6). Predictors 1–6 were obtained in 1973.

Optimism (Predictor 7) was defined as an explanatory style pertaining to how one explains life events (Seligman, 2006).

Optimists view bad events as temporary, local, and external; whereas, pessimists view bad events as permanent, pervasive, and personal (e.g., "It's going to last forever;" "It's all my fault;" "It's going to ruin me."). Participants' MMPI scales (obtained in 1975) were used to produce an MMPI Optimism–Pessimism explanatory style scale (Colligan, Offord, Malinchoc, Shulman, & Seligman, 1994). Since we did not have access to item level data, to derive our variable we employed a regression equation specifically developed to assist researchers with access to scale but not item-level data (Malinchoc, Offord, & Colligan, 1998).

In addition, Scale 4, Psychopathic Deviate (PD) of the MMPI (Predictor 8; McKinley & Hathaway, 1944), which taps features such as authority conflicts, impulsivity, and interpersonal insensitivity, was also included in this study. This predictor was previously found to be inversely associated with resilience (Segovia et al., 2012).

For a few of these predictor variables, there was some missing data. These included the optimism–pessimism variable, the psychopathic deviancy variable, the number of captivity related medical problems, and the number of sleep problems at repatriation. The reasons were that either data were not collected at or near repatriation (1973), original records were no longer readable, and/or there were incomplete medical records.

Dependent variables: Physical health-outcomes (nine variables total). Allostatic load refers to the physiological consequences of the body's adaption to chronic stress. It is measured by 10 biomarkers with established thresholds (Friedman & McEwen, 2003). The biomarkers and respective thresholds in this study are as follows: systolic blood pressure (≥ 148 mmHg), diastolic blood pressure (≥ 82 mmHg), body mass index (BMI; ≥ 30), ratio of total cholesterol to HDL cholesterol (≥ 5.9), HDL cholesterol (≤ 37 μ g/dL), glycosylated hemoglobin ($\geq 7.1\%$), urine cortisol (≥ 25.7 μ g/g creatinine), urine norepinephrine (≥ 48 μ g/g creatinine), urine epinephrine (≥ 5 μ g/g creatinine), and serum DHEA-S (≤ 350 ng/mL). Participants with a biomarker reading beyond the threshold received a point for that bimeasure (Seeman et al., 1997). The points were then summed to obtain the allostatic load score, with a maximum of 10. For ease of interpretation, each participant's score was calculated to a percentage (i.e., total allostatic load score divided by 10; multiplied by 100).

The Cumulative Illness Rating Scale (CIRS) uses a 5-point scale to estimate the severity of pathology in 13 body systems to include cardiovascular, respiratory, gastrointestinal, musculoskeletal, hepatic, endocrine, neurological and psychiatric. It is considered a valid predictor of morbidity (Hudon, Fortin, & Vanasse, 2005). Scores range from 0 to 4. A score of 0 indicates no impairment, while a score of 4 suggests multiple issues that are potentially life threatening.

The SF12 version 2 (derived from the SF-36 Health Survey) is a 7-question short-form survey measuring mental and physical functions; it is considered a valid and reliable measure for overall health (Ware, Kosinski, & Keller, 1996). Participants were asked to rank elements of their health and quality of life as follows: 1 (*all of the time*) to 5 (*none of the time*), or 1 (*yes, limited a lot*) to 3 (*no, not limited at all*). Higher scores indicated exceptional health with some items needed to be reverse-scored for uniformity in directionality. Internal consistency reliability was .85.

Telomeres are chromosome ends of repetitive nucleotide sequences which shorten with chronological age. Chronic stress

impacts health by modulating the rate of cellular aging, which presents as shorter telomeres (Epel, Blackburn, Lin, Firdaus, Adler, Morrow, & Cawthon, 2004). Spectracell Laboratories (Houston, TX), a specialized, clinical-testing laboratory company, was used to measure telomere length from nucleated white blood cells from whole blood. Spectracell's proprietary telomere scores (0–12) were calculated based on telomere length and patient age, with the higher the score, the “younger” the cells (i.e., longer telomere length than stated age). This telomere score was then compared to a population in the same age range (normed by Spectracell Laboratories) to determine individual percentile scores relative to age and population.

To measure lung function, each participant completed spirometry testing according to standardized protocols derived from Miller et al. (2005). Spirometry measures the amount of air a person can forcefully exhale in 1 s (i.e., forced expiratory volume in 1 s, known as FEV1). It is a marker of the degree of obstruction, and it is commonly used to diagnose asthma and chronic obstructive lung disease. FEV1 results are affected by age, gender, race, and height, so percent predicted FEV1 results are the most meaningful. Scores above 80% are considered “normal” (Schünemann, Dorn, Grant, Winkelstein, & Trevisan, 2000). Singh-Manoux et al. (2011) reported an association between lung function (FEV1) and cognitive and physical function. FEV1 has also been shown to independently predict mortality (Schünemann et al., 2000).

The 10-meter Timed Walking Speed is a valid and reliable test that provides a snapshot of gait velocity, and it has served as a predictor of health status (Purser et al., 2005) and mortality (Studenski et al., 2011). For this test, individuals were instructed to walk at a normal speed for 10 m until the examiner said stop. The test was performed twice, and was then averaged for each participant as a final score.

Dominant hand-grip strength has been documented to accurately predict body strength, nutritional status, fatigue, and overall physical function (Waldo, 1996; Cooper, 2007). To assess grip strength, we used the Lafayette Hand Dynamometer with scores ranging from 0 to 100 kg. High and low scores were assigned to participants based on the distribution in our sample.

Evidence suggests self-reported sleep efficiency predicts mortality (Dew et al., 2003). Poor sleep efficacy also predicts psychiatric illness in survivors of extreme trauma (Segovia et al., 2013). A sleep efficacy score was calculated for each participant by dividing time spent asleep (total sleep time) by the amount of time spent in bed.

An online family history questionnaire was designed to collect a Family physical disease burden to determine whether resiliency (defined at the time of survey development as no psychiatric illnesses posttrauma in RPWs) was associated with any component of their family history (for survey details see Hoyt, Hui-Min, Huftless, Mbizo, & Rice, 2013). Results from the questionnaire were used to calculate an individual “family disease burden value” for each participant's nuclear family (i.e., parents and siblings). To calculate this variable, the total number of physical illnesses in the individual's family was divided by the total number of nuclear family members.

Dependent variables: Psychological health-outcome variables (nine variables total). The Satisfaction With Life Scale (SWLS; Pavot & Diener, 1993; Variable 1) is a five item measure of global life satisfaction. Respondents rate the extent of their

agreement with general statements such as “In most ways my life is close to my ideal” on a 7-point scale; a score of 1 represents *strongly disagree* and 7, *strongly agree*. This scale shows convergent validity with other scales and other types of assessments of subjective well-being (Pavot & Diener, 1993). The scale is scored by summing the responses to each item and has a coefficient alpha of .78.

The Quality of Life Inventory (QOLI; Frisch, 1994; Variable 2) was developed to measure positive mental health. It consists of 32 items (16 domains with two items per domain) to measure areas of life empirically associated with overall life satisfaction (e.g., love, work, and play; Frisch, 1994). Respondents rate the importance of each domain in relationship to their overall happiness and satisfaction. Overall happiness is rated on a scale of 0 (*not at all important*), 1 (*important*), or 2 (*very important*). Satisfaction ratings range on a scale from -3 (*very dissatisfied*) to +3 (*very satisfied*). The importance and satisfaction ratings for each item are multiplied to form weighted satisfaction ratings ranging from -6 to 6. The total score reflects one's satisfaction in areas of life they consider important. Internal consistency reliability was .87.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; Variable 3). This scale is comprised of two mood scales measuring positive and negative affect. Each item is rated on a 5-point scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*) to indicate the extent to which the respondent has felt this way in the past week. To score the PANAS, the sum of negative items is divided by the sum of all positive items. The PANAS has an alpha coefficient of .77 for the negative scale, and .79 for the positive scale.

The Scales of Psychological Well-Being (Ryff, 1989; Variables 4–9) were used to examine the six psychological variables. Autonomy (4), environmental mastery (5), personal growth (6), positive relations with others (7), purpose in life (8), and self-acceptance (9) were measured using six, 14-item scales of psychological well-being, constructed to measure each of these domains individually (see Ryff, 1989 for details). Each item is rated on a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). High scores indicate high self-ratings on the dimension assessed; responses to negative items were reverse scored. These scales had an alpha coefficient of .75 for autonomy, .87 for environmental mastery, .84 for personal growth, .87 for positive relations, .84 for purpose in life, and .85 for self-acceptance.

Data Analysis

The above 18 outcome dependent variables were continuous variables. Of the physical variables, there is missing data for three variables: Some RPWs elected not to complete the Family History Physical Disease Burden survey, and dominant hand grip and walking speed were missed with some of the RPWs early in the study because these variables were added after the initiation of the study. Each dependent variable was normalized by converting it to a *z* score using sample means and standard deviations. A summary score was obtained using the available *z* scores within each category, yielding a physical and psychological score for each individual ($n = 128$). Higher scores indicated better physical and psychological health.

As a first step in identifying our new model of resilience, which included state of health, we conducted Pearson correlation analyses of the averaged z scores with seven of the predictor variables associated with RPW resilience (Segovia et al., 2012; Segovia, Moore, Linnville, Hoyt, & Hain, 2013). These were continuous variables. For the eighth predictor variable, officer versus enlisted (a categorical variable), we conducted independent t tests with the health z scores.

In the next phase of model building, those predictor variables which were identified in the correlations or t tests as significant were then included in two linear regressions (one with the physical z scores and the other with the psychological z scores) to determine which predictor variables contributed the most to these two health ratings. In the final phase of model building, one way analyses of variance (ANOVA) were done with the most significant predictors to determine if there were differences in levels of positive health in RPWs with psychiatric illness versus those without any psychiatric illness. IBM SPSS Version 19.0 was the statistical package used in these series of analyses.

Results

Descriptive statistics can be found for seven of the eight predictor variables in Table 1. The eighth predictor variable, officer ($n = 119$) or enlisted ($n = 9$), is listed here. Descriptive statistics for the 18 dependent variables (nine physical and nine psychological) can be found in Tables 2 and 3.

Pearson Correlations and t Tests Between Predictors and Health-Outcome Variables

Table 4 shows a number of the predictors correlated with physical and psychological health outcome z scores. With regard to physical health, fewer sleep complaints at repatriation ($r = -.38$, $p < .001$) and number of captivity-related medical problems ($r = -.32$, $p < .001$) were the strongest correlations and the most significant, followed by optimism ($r = -.29$, $p < .01$) and, to a lesser degree, antisocial/psychopathic personality, solitary confinement duration, and age at time of capture (see Table 4). With regard to psychological health, optimism ($r = -.48$, $p < .001$) was the largest and most significant correlation, followed by MMPI PD ($r = -.27$, $p < .001$), PTSS at repatriation ($r = -.24$, $p < .001$), number of captivity-related medical problems ($r = -.22$, $p < .01$), and, to a lesser degree, fewer sleep complaints at time of repatriation (see Table 4). T tests comparing officer to enlisted status were not statistically significant for physical ($t = 1.01$, $df = 7.23$,

Table 1
Predictors of Resilience in RPWs (Independent Variables)

Variable	<i>n</i>	<i>M</i>	<i>SD</i>
Captivity (months)	128	51.0	32.4
Solitary (weeks)	128	26.5	36.4
Age at capture (years)	128	29.1	4.8
Pessimism (t scores)	89	43.6	7.6
Psychopathic deviancy (raw scores)	89	15.2	4.3
Number of captivity medical problems	95	8.0	5.3
Number of sleep problems at repatriation	113	0.4	1.0

Note. RPW = repatriated prisoner of war.

Table 2
Means and Standard Deviations for the Physical Variables (Dependent Variables)

Variable	<i>n</i>	<i>M</i>	<i>SD</i>
Allostatic load (% in pathologic range)	128	22.3	15.8
FEV1 percent predicted	128	99.0	19.6
Dominant hand-grip strength (kg)	105	45.2	8.5
Walking speed (m/s)	105	1.3	0.2
Cumulative Illness Rating Scale total	128	8.6	4.4
SF12 physical health composite score	128	44.8	9.7
Telomere score	128	6.5	1.3
Sleep efficiency (%)	128	89.5	11.6
Family history physical disease burden	91	1.5	0.9

$p = .35$ and psychological z score variables ($t = 1.21$, $df = 7.25$, $p = .27$). Please note, SPSS tests for equality of variance (Levene's test) in these latter analyses and adjusts t -test degrees of freedom when equal variances are not assumed between groups.

Predicting Positive Health

Of the eight documented predictors of resilience in RPWs, sleep complaints postrepatriation, medically related problems during captivity, and optimism most significantly correlated with physical health. The subsequent linear regression analysis for the physical health scores used these predictor variables in the analyses. A significant portion of the total variation in physical health was predicted by these three variables, $F(3, 63) = 8.26$, $p < .0001$. The variance accounted for by the model was moderate, adjusted $R^2 = .25$. In addition, we found optimism was the strongest predictor of physical health ($\beta = -.33$, $t = -2.73$, $p = .008$), followed by fewer sleep complaints ($\beta = -.29$, $t = -2.52$, $p = .014$).

Optimism, PTSS, and initial MMPI PD scores were the most significantly correlated with psychological health. The subsequent linear regression analysis for the psychological health scores included these predictor variables in the analyses. Again, the results suggest a significant portion of the total variation in psychological health was predicted by these three variables, $F(3, 58) = 5.10$, $p = .003$. The adjusted variance accounted for by the model was moderate, $R^2 = .17$. Optimism was also the strongest predictor of psychological health ($\beta = -.41$, $t = -2.87$, $p = .006$), followed

Table 3
Means and Standard Deviations for the Psychological Variables (Dependent Variables)

Variable	<i>n</i>	<i>M</i>	<i>SD</i>
Quality of life t score	128	54.7	10.2
Life satisfaction	128	28.6	4.4
PANAS ratio	128	3.1	0.8
Autonomy	128	65.9	8.5
Environmental mastery	128	70.6	8.8
Personal growth	128	66.8	9.0
Positive relations	128	67.9	9.8
Purpose in life	128	69.8	8.9
Self-acceptance	128	71.4	8.4

Note. PANAS = Positive and Negative Affect Schedule.

Table 4

Predictors of Physical and Psychological Positive Health

Predictor	Health status today	
	Physical health z score	Psychological health z score
Prior predictors of resilience:		
RPW		R
Age at time of capture	−0.170*	−0.101
Solitary duration	−0.191*	−0.124
Captivity medical problems	−0.317***	−0.223**
Sleep	−0.382***	−0.170*
PTSS	−0.154	−0.243**
MMPI-PD	−0.205*	−0.266***
Optimism	−0.292**	−0.482***
<i>t</i> test		
Officer/enlisted status	1.01	1.21

Note. RPW = repatriated prisoner of war; PTSS = posttraumatic stress symptoms; MMPI-PD = Minnesota Multiphasic Personality Inventory—Psychopathic Deviate scale.

* $p < .05$. ** $p < .01$. *** $p < .001$.

by PTSS scores ($\beta = -.23$, $t = -1.88$, $p = .07$), and then MMPI PD scores ($\beta = -.06$, $t = -.37$, $p = .71$).

Physical and Psychological Health as a Function of Absence of Psychiatric Illness

The ANOVAs looking for differences in levels of positive health between RPWs diagnosed with a psychiatric illness versus those without a psychiatric illness revealed some significant findings. RPWs who had been diagnosed with a psychiatric illness ($n = 50$, 39% of sample) had a statistically significant decrease in positive physical health ($M = -.12$, $SD = \pm .52$) compared to RPWs with no psychiatric illness ($n = 78$, 61% of sample; $M = .08$, $SD = \pm .40$), $F(1, 126) = 5.78$, $p = .02$, Cohen's $d = .42$ (small effect size). Similarly, RPWs with a psychiatric illness had a statistically significant decrease in psychological "positive health" ($M = -.28$, $SD = \pm .89$) compared to RPWs with no psychiatric illness ($M = .17$, $SD = \pm .61$), $F(1, 126) = 11.06$, $p = .001$, Cohen's $d = .60$ (moderate effect size).

Discussion

In our previous study (Segovia et al., 2012), we demonstrated that optimism was the single most significant predictor of resilience in RPWs. However, we were concerned about the use of a limited definition of resilience defined solely as a lack of psychiatric illness. In this study, we expanded the interpretation of resilience to include health. In this study, optimism, identified years earlier, remained a robust positive effect and the strongest predictor of current positive health, despite the use of stringent and detailed measures of positive physical and mental health. Our results here demonstrate its protective role on current health years after the exposure to severe trauma and extreme circumstances that these individuals had experienced. This finding is promising because out of all the factors examined, optimism accounts for the most variance explained and is the only variable that can be altered through intervention.

The sports and commercial industry have used optimism training to increase performance among athletes and salespersons (Seligman, 2006). However, the largest and most controversial consumer of optimism training is the United States Army (Eidelson, Pillisuk, & Soldz, 2011). The Army's Comprehensive Soldier Fitness Training program is based on optimism for coping with emotional distress (Casey, 2011). The training was launched after military leaders decided training in psychological health was lacking (De Luce, 2009). The current study highlights the importance of optimism training for our military service members and suggests that its effects reach beyond increased performance. Optimism's protective effects on health, over and above negatively impacting variables like physical injuries or severe torture, including solitary confinement, suggest a promising area of intervention.

Predictors of Positive Physical Health

The finding that multiple captivity-related medical problems are associated with decreased positive health is consistent with previous studies documenting the presence and/or severity of physical injury as a risk factor for PTSD (Gabert-Quillen, Fallon, & Delahanty, 2011; Park et al., 2012). Studies that focus specifically on a military population document an increased risk of PTSD associated with combat-related injury compared to uninjured soldiers experiencing the same combat events (Koren, Norman, Cohen, Berman, & Klein, 2005). However, our study expanded upon these findings by indicating physical and uncontrollable factors, such as degree and severity of injury, hold less predictive power in determining physical health than a psychological and manipulative variable like optimism. Consistent with previous studies with RPWs, the dosage effect or the idea that type, duration, and intensity of exposure influence healthy adjustment (Bonanno & Mancini, 2008) is not supported in this study.

The importance of sleep quality is beginning to gain salience in military settings as researchers find significant associations between sleep symptoms and mental health issues. One recent study found 41% of U.S. service members recently deployed to Iraq and Afghanistan reported sleep problems at initial screening. In addition, service members who reported sleep issues like insomnia also reported significantly higher scores of PTSD severity at follow-up than did service members without sleep issues (McLay, Klam, & Volkert, 2010). Segovia et al. (2013) demonstrated that better sleep quality in RPWs is proportional to the maintenance of positive health. The present study expanded upon these findings, demonstrating that even when "health" is defined more stringently, sleep continues to have a significant role. Despite the importance of captivity-related medical problems and sleep, optimism remained the statistically strongest predictor of positive physical health in the long term.

Predictors of Positive Psychological Health

The current study replicated prior research results with RPWs (Segovia et al., 2012), documenting that the presence of PTSD symptoms upon repatriation, elevated scores on the MMPI-PD scale (indicating antisocial personality features) and lower levels of optimism were negatively associated with positive health. It is unclear whether partial PTSD in 1973 led to full PTSD later on due to exacerbation or delay. These findings highlight the importance

of early PTSD screening. In addition, the MMPI-PD score results indicate that screening for individuals with antisocial personality features such as authority conflicts, impulsivity, and interpersonal insensitivity may be useful when recruiting individuals for high-risk or extreme stress operations.

Limitations and Strengths

This study has a number of limitations. First, the findings are based on a unique cohort, RPWs. The individuals examined in this study represented repatriates from the original 1973 group who, to date, survived, remained interested in follow-up and obtained follow-up during the timeframe of this study. As such, the ones who visited the center during the studies data collection timeframe may even be more unique than those who have either rarely or never visited the center after the initial 1973 assessment. Thus, the participants who visited here during that timeframe were more likely to be active and healthy than to those who were unable or unwilling to be annually followed. In addition, the literature is replete with other variables not included in this study which are associated with mental and physical health (e.g., smoking, alcohol, and drug consumption). Finally, our results may not generalize to the average U.S. adult male over 70 years of age.

Despite what has been predicted for former POWs (Port, Engdahl, Frazier, & Eberly, 2002), our study demonstrates the Vietnam-era RPWs have been able to maintain positive health. Thus, this study is evidence that resilient individuals can overcome traumatic experiences and maintain a positive, healthy lifestyle.

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